

	Type	Hits	Search Text	DBs
1	BRS	3	"null operation" and JVM	USPAT; EPO; JPO; IBM_TDB
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3	BRS	0	RTSJ and java	USPAT; EPO; JPO; IBM_TDB
4	BRS	0	RTSJ	USPAT; EPO; JPO; IBM_TDB
5	BRS	52	"null operation" and "instruction set"	USPAT; EPO; JPO; IBM_TDB
6	BRS	3	("null operation" and "instruction set") and (garbage near collection)	USPAT; EPO; JPO; IBM_TDB
7	BRS	0	(NOP\$ or "null operation") near10 JVM	USPAT; EPO; JPO; IBM_TDB
8	BRS	271	(NOP\$ or "null operation") near3 data	USPAT; EPO; JPO; IBM_TDB
9	BRS	0	((NOP\$ or "null operation") near3 data) and JVM	USPAT; EPO; JPO; IBM_TDB
10	BRS	3	((NOP\$ or "null operation") near3 data) and java	USPAT; EPO; JPO; IBM_TDB
11	BRS	10	(NOP\$ or "null operation") and JVM	USPAT; EPO; JPO; IBM_TDB
12	BRS	7	(NOP or "null operation") and JVM	USPAT; EPO; JPO; IBM_TDB
13	BRS	5	("null operation") and JVM	USPAT; EPO; JPO; IBM_TDB
14	BRS	0	("null operation") near4 reference and java	USPAT; EPO; JPO; IBM_TDB
15	BRS	3	("null operation") near4 reference	USPAT; EPO; JPO; IBM_TDB
16	BRS	3	"null operation" and "garbage collection"	USPAT; EPO; JPO; IBM_TDB
17	BRS	10	"null operation" and java	USPAT; EPO; JPO; IBM_TDB
18	BRS	0	java near2 "null operation"	USPAT; EPO; JPO; IBM_TDB
19	BRS	0	java near10 "null operation"	USPAT; EPO; JPO; IBM_TDB

	Type	Hits	Search Text	DBs
20	BRS	0	jvm near10 "null operation"	USPAT; EPO; JPO; IBM_TDB
21	BRS	1	"instruction set" near10 "null operation"	USPAT; EPO; JPO; IBM_TDB
22	BRS	1	"null operation" near2 data	USPAT; EPO; JPO; IBM_TDB
23	BRS	4	"null operation" near2 field	USPAT; EPO; JPO; IBM_TDB
24	BRS	27	"null operation" near10 data	USPAT; EPO; JPO; IBM_TDB
25	BRS	2	("null operation" near10 data) and java	USPAT; EPO; JPO; IBM_TDB
26	BRS	0	"null operation" near10 "bit vector"	USPAT; EPO; JPO; IBM_TDB
27	BRS	3	"null operation" near10 vector	USPAT; EPO; JPO; IBM_TDB


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### Err Msg: "Operation not yet implemented" when scheduling to 'Excel ...

... ePortfolio/Web Desktop. Topic: Scheduling. Keywords: SCHEDULE EXCEL DATA ONLY TEXT OBJECT **NULL OPERATION** IMPLEMENTED UNIX CE85 CE. Status: Reported Issue. Product: ... support.businessobjects.com/ library/kbase/articles/c2015225.asp - 21k - [Cached](#) - [Similar pages](#)

### ILEngineer - Crummy .NET Decompiler \* Copyright (C) 2001-2002 Jay ...

... Synchronize static label; int m\_Goto; bool m\_Block; bool m\_Target; public: Statement(Blocks::Method \*method, uint8\_t \*offset = **NULL**) : **Operation**(method, offset ... svn.saurik.com/repos/ninetjer/ trunk/ilengineer/Statement.h - 4k - [Cached](#) - [Similar pages](#)

### [PDF] Slide presentation Template

File Format: Microsoft Powerpoint 97 - [View as HTML](#)

... list). adminid bigint NOT **NULL**,-- Administrator's identifier. operation smallint NOT **NULL**,-- **Operation** on the container. allow tinyint ... edg-wp2.web.cern.ch/edg-wp2/ security/voms/edg-scg-2003-07.ppt - [Similar pages](#)

### [PDF] Abstract Poster

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... heat and particle flux •For a balanced double null, particle control best with symmetric pumping •Designed for lower or upper single **null operation** QTYUIOP ... 202.127.205.62/2002年/学术报告/ 外10月23日/JT-60SU%20Div%20Design.pdf - [Similar pages](#)

### Constants

... MPI\_COMM\_NULL - Null communicator MPI\_OP\_NULL - **Null operation** MPI\_GROUP\_NULL - Null group MPI\_DATATYPE\_NULL - Null datatype MPI\_REQUEST\_NULL - Null request ... www.mpi-softtech.com/products/ cluster/mpi\_pro/doc/Functions/Constants.html - 18k - [Cached](#) - [Similar pages](#)

### using System; /// double implementation class CalcFunc { public ...

... static string SwitchSign(String number) { return -Double.Parse(number) + ""; public static String CalculateResult() { sign = **null**; **operation** = null; empty ... lumumba.luc.ac.be/~kris/projects/ uiml.net/examples/CalcFunc.cs - 2k - [Cached](#) - [Similar pages](#)

### using System; /// int implementation class CalcFunc { public ...

... static string SwitchSign(String number) { return -Int32.Parse(number) + ""; public static String CalculateResult() { sign = **null**; **operation** = null; empty ... lumumba.luc.ac.be/~kris/projects/ uiml.net/examples/CalcFuncInt.cs - 2k - [Cached](#) - [Similar pages](#)

### SR @ HHH - Matrix (Otaku Echoes)

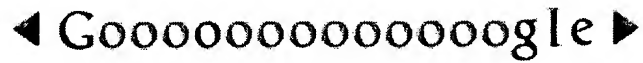
... 16, Passive Alert. 21, **Null Operation**. 26, Daemon Activation. 30, Operator (Decker) Notification. 33, **Null Operation**. 37, Sparky-IC. 42, Active Alert. 47, **Null Operation**. ... www.hoosierhackerhouse.com/mtx/ota/echo\_ftoj.html - 27k - [Cached](#) - [Similar pages](#)

### Re: [lug] wget question

... mypasswd@machine1/./README > > -10:05:02-- ftp://user:xxxxxxx@machine1:21/README > > The two above are the same thing, except for the **null operation** of "cd ... archive.lug.boulder.co.us/bymonth/2002.06/msg00033.html - 6k - [Cached](#) - [Similar pages](#)

### Dynamic Query Runner

... request.getParameter("operation"); Worker worker = new Worker(); //Holds the methods  
to do individual operations if(operation == null) operation = "4"; //Will ...  
www.imranweb.com/dynQuery.txt - 15k - [Cached](#) - [Similar pages](#)



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 Yuanyuan Zhao , Rob Strom  
**Proceedings of the twentieth annual ACM symposium on Principles of distributed computing** August 2001

Publish-subscribe messaging middleware typically offers limited and low-level options for quality of service, such as best-effort delivery versus reliable delivery, or ordered versus unordered. We propose a new, high-level approach to specifying quality of service, in which the consumer specifies an *event stream interpretation* function that maps an event stream into a state that represents the consumer's semantics of the stream. Under this approach, the system may deliver either the su ...
- 2** How things were: Programming lessons from days gone by: extreme design 77  
 Alan Creak  
**ACM SIGPLAN Notices** December 2003  
 Volume 38 Issue 12
- 3** Integrating object-oriented programming and protected objects in Ada 95 77  
 A. J. Wellings , B. Johnson , B. Sanden , J. Kienzle , T. Wolf , S. Michell  
**ACM SIGAda Ada Letters** June 2002  
 Volume XXII Issue 2

Integrating concurrent and object-oriented programming has been an active research topic since the late 1980's. There is now a plethora of methods for achieving this integration. The majority of approaches have taken a sequential object-oriented language and made it concurrent. A few approaches have taken a concurrent language and made it object-oriented. The most important of this latter class is the Ada 95 language, which is an extension to the object-based concurrent programming language Ada ...

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

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java "null operation"

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1. **[Java Advanced Imaging: Class NullDescriptor](#)**   
 ... An OperationDescriptor describing the **"Null" operation**. The **"Null" operation** performs no processing ...  
 DocURL: <http://java.sun.com/products/java-media/jai/forDevelopers/jai-apidocs> ...  
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2. **[http://abone-tcs.sdl.sri.com/mirror/bro.isi.edu/JRSVP\\_CURRENT/ua/mgmt/applet/WebReq.java](http://abone-tcs.sdl.sri.com/mirror/bro.isi.edu/JRSVP_CURRENT/ua/mgmt/applet/WebReq.java)**   
 ... import **java**.io.InputStream; import **java**.io.OutputStream; import **java**.io.DataInputStream; import **java**.io ...  
 System.err.println("**Null Operation**"); douts.writeUTF("**\*\* Null Operation \*\***\n ...  
[abone-tcs.sdl.sri.com/mirror/bro.isi.edu/JRSVP\\_CURRENT/ua/mgmt/applet/WebReq.java](http://abone-tcs.sdl.sri.com/mirror/bro.isi.edu/JRSVP_CURRENT/ua/mgmt/applet/WebReq.java) - 23k - [Cached](#) - [More pages from this site](#)
3. **[geotools/geotools2/geotools-src/gcs-coverage/src/org/geotools/gp/Resampler.java](#)** - view - 1   
 ... J2SE dependencies import **java**.awt.Dimension; import **java**.awt.Rectangle; import **java**.awt.RenderingHints; import **java**.awt ... initially wrapped into in a **"Null" operation**. Later, we will ...  
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5. **[Source of webl.lang.expr.SetExpr.java](#)**   
 ... import webl.util.\*; import **java**.util.\*; publicclass SetExpr extends ValueExpr implements ... VersionTree vt, Ve V) { Operation R = **null**; **Operation** o = operations; while ...  
[www.research.digital.com/SRC/WebL/sources/webl.lang.expr.SetExpr.java.html](http://www.research.digital.com/SRC/WebL/sources/webl.lang.expr.SetExpr.java.html) - 28k - [Cached](#)
6. **<http://www.ccs.neu.edu/research/demeter/DemeterJSR31/com1800/sp01/rathod/labguide/src/gen/Parser.jj>**   
 options { STATIC = false; **JAVA\_UNICODE\_ESCAPE** = true; } **PARSER\_BEGIN**(Parser) import **java**.util.\*; imp **java**.io.\*; import edu.neu.ccs.demeter.\*; public class Parser { // oit is ugly.  
[www.ccs.neu.edu/research/demeter/DemeterJSR31/com1800/sp01/rathod/labguide/src/gen/Parser.jj](http://www.ccs.neu.edu/research/demeter/DemeterJSR31/com1800/sp01/rathod/labguide/src/gen/Parser.jj) - 19k - [Cached](#)
7. **<http://www.cis.ksu.edu/SELab/Mak/UDGP/ProjectDoc.java>**   
 ... import **java**.io.\*; import **java**.awt.\*; import **java**.awt.image.\*; import **java**.applet.\*; import ... cvTempG); } else { JOptionPane.showMessageDialog(**null**, "**Operation** not accessible from the ...  
[www.cis.ksu.edu/SELab/Mak/UDGP/ProjectDoc.java](http://www.cis.ksu.edu/SELab/Mak/UDGP/ProjectDoc.java) - 32k - [Cached](#)
8. **<http://cs.baylor.edu/~sturgill/research/gape/gape/client/ScenarioEditor.java>**   
 A domain independent ScenarioEditor/Viewer.  
[cs.baylor.edu/~sturgill/research/gape/gape/client/ScenarioEditor.java](http://cs.baylor.edu/~sturgill/research/gape/gape/client/ScenarioEditor.java) - 21k - [Cached](#)

9. [eNode Clients for Web Services — Fax](#)   
 Table of Contents. Markup Tutorial. Interfacing with **Java™** Web Services. EMail Client. Translation Client. A Si SOAP-based Fax Client  
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11. <http://www.omg.org/issues/issue3250.txt>   
 Issue 3250: Null valuetypes not supported by DynValue (orb\_revision) Source: IONA (Mr. ... boolean is\_null(); T is **null operation** returns TRUE if the DynValue represents a null valuetype ... perform strict exception checkin (like **Java**) will no longer compile using the ...  
[www.omg.org/issues/issue3250.txt](http://www.omg.org/issues/issue3250.txt) - 199k - [Cached](#) - [More pages from this site](#)
12. [ModelMBeanInfo \(Java Management Extensions 1.2 API Specification\)](#)   
 ... **Java** resources wishing to be manageable instantiate the ModelMBean using the MBeanServer's createMBe method ... Wraps an IllegalArgumentException for a **null operation** name. ...  
[star.cs.byu.edu/jmx\\_1.2/api/javax/management/modelmbean/ModelMBeanInfo.html](http://star.cs.byu.edu/jmx_1.2/api/javax/management/modelmbean/ModelMBeanInfo.html) - 36k - [Cached](#)
13. [ModelMBeanInfo \(Java 2 Platform SE v1.5.0\)](#)   
 ... **Java** resources wishing to be manageable instantiate the ModelMBean using the MBeanServer's createMBe method ... Wraps an IllegalArgumentException for a **null operation** name. ...  
[java.sun.com/j2se/1.5.0/docs/api/javax/management/modelmbean/ModelMBeanInfo.html](http://java.sun.com/j2se/1.5.0/docs/api/javax/management/modelmbean/ModelMBeanInfo.html) - 41k - [Cached](#) - [More pages from this site](#)
14. <http://cs.baylor.edu/~sturgill/research/gape/gape/client/OldScenarioEditor.java>   
 A domain independent ScenarioEditor/Viewer.  
[cs.baylor.edu/~sturgill/research/gape/gape/client/OldScenarioEditor.java](http://cs.baylor.edu/~sturgill/research/gape/gape/client/OldScenarioEditor.java) - 19k - [Cached](#)
15. [: Class NullDescriptor](#)   
 ... Class NullDescriptor. **java.lang.Object** | +-javax.media.jai.OperationDescriptorImpl ... OperationDescriptor describing the "**Null**" operation. The "**Null**" operation performs no processing ...  
[www-mipl.jpl.nasa.gov/~rgd/OpSpec/NullDescriptor.html](http://www-mipl.jpl.nasa.gov/~rgd/OpSpec/NullDescriptor.html) - 18k - [Cached](#)
16. [Long \(JML and MultiJava documentation\)](#)   
 ... DETAIL: FIELD | CONSTR | METHOD. **java.lang. Class Long. java.lang.Object** | +- **java.lang** ... null&&! nm.equals("")&&System.getProperty(nm) != **null&&Operation.decodeable(System.getProperty(nm** ...  
[www.dc.fi.udc.es/ai/tp/practica/jml/JML/javadocs/java/lang/Long.html](http://www.dc.fi.udc.es/ai/tp/practica/jml/JML/javadocs/java/lang/Long.html) - 53k - [Cached](#)
17. <http://www.omg.org/issues/issue3135.txt>   
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... simpleACL; import java.net.URL; import java.util.Enumeration; import java ... debug( "Adding operation : " + ((null == operation) ? "<<DEFAULT>>" : operation ) + " with " + allowed ...  
neem.cs.ttu.edu/jxta\_src/platform\_src/platform/binding/java/impl/src/net/jxta/impl/access/simpleACL/ S - 19k - [Cached](#)

20. [\[Www-cvs\] CVS update: reptile/src/java/org/openprivacy/reptile](#)   
... Modified Files: ContentTransformer.java ReptileServlet.java Log Message: login ... null ) { - if ( operation == { - operation = "null"; + PageDispatchEngine.dispatch( request ...  
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Relevance scale ☐ ☐ ☐ ☐ ☐**1 Executable JVM model for analytical reasoning: a study**

Hanbing Liu, J Strother Moore

June 2003 **Proceedings of the 2003 workshop on Interpreters, Virtual Machines and Emulators**Full text available: [pdf\(230.18 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

To study the properties of the Java Virtual Machine(JVM) and Java programs, our research group has produced a series of JVM models written in a functional subset of Common Lisp. In this paper, we present our most complete JVM model from this series, namely, M6, which is derived from a careful study of the J2ME KVM [16] implementation. On the one hand, our JVM model is a conventional machine emulator. M6 models accurately almost all aspects of the KVM implementation, including the dynamic class lo ...

**2 Compiling scheme to JVM bytecode: a performance study**

Bernard Paul Serpette, Manuel Serrano

September 2002 **ACM SIGPLAN Notices , Proceedings of the seventh ACM SIGPLAN international conference on Functional programming**, Volume 37 Issue 9Full text available: [pdf\(298.96 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We have added a Java virtual machine (henceforth JVM) bytecode generator to the optimizing Scheme-to-C compiler Bigloo. We named this new compiler BiglooJVM. We have used this new compiler to evaluate how suitable the JVM bytecode is as a target for compiling strict functional languages such as Scheme. In this paper, we focus on the performance issue. We have measured the execution time of many Scheme programs when compiled to C and when compiled to JVM. We found that for each benchmark, at least ...

**Keywords:** Java virtual machine, compilation, functional languages, scheme**3 Exploiting FPGA concurrency to enhance JVM performance**

James Parnis, Gareth Lee

January 2004 **Proceedings of the 27th conference on Australasian computer science - Volume 26**Full text available: [pdf\(221.02 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#)

The Java Programming Language has been praised for its platform independence and portability, but because of its slow execution speed on a software Java Virtual Machine (JVM), some people decide to use faster languages such as C. Building a JVM in hardware is

an obvious solution to this problem. Several approaches have been taken to try to achieve the best solution. One approach is by reducing the number of Java instructions a program has to execute along with directly executing instructions in ...

**Keywords:** FPGA, Java virtual machine, field programmable logic

#### 4 Java Virtual Machine: JVM versus CLR: a comparative study

Jeremy Singer

June 2003 **Proceedings of the 2nd international conference on Principles and practice of programming in Java**


Full text available:  pdf(84.98 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

We present empirical evidence to demonstrate that there is little or no difference between the Java Virtual Machine and the .NET Common Language Runtime, as regards the compilation and execution of object-oriented programs. Then we give details of a case study that proves the superiority of the Common Language Runtime as a target for imperative programming language compilers (in particular GCC).

#### 5 A static type system for JVM access control

Tomoyuki Higuchi, Atsushi Ohori

August 2003 **ACM SIGPLAN Notices , Proceedings of the eighth ACM SIGPLAN international conference on Functional programming**, Volume 38 Issue 9

Full text available:  pdf(150.01 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents a static type system for JAVA Virtual Machine (JVM) code that enforces an access control mechanism similar to the one found, for example, in a JAVA implementation. In addition to verifying type consistency of a given JVM code, the type system statically verifies that the code accesses only those resources that are granted by the prescribed access policy. The type system is proved to be sound with respect to an operational semantics that enforces access control dynamically, si ...

**Keywords:** JVM, access control, stack inspection, type inference, type system

#### 6 A high performance cluster JVM presenting a pure single system image

Y. Aridor, M. Factor, A. Teperman, T. Eilam, A. Schuster

June 2000 **Proceedings of the ACM 2000 conference on Java Grande**

Full text available:  pdf(916.33 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

#### 7 JVM: platform independent vs. performance dependent

Ruben Pinilla, Marisa Gil

April 2003 **ACM SIGOPS Operating Systems Review**, Volume 37 Issue 2

Full text available:  pdf(4.93 MB) Additional Information: [full citation](#), [abstract](#), [references](#)

Nowadays Java technology has become an important reference to application developers. The great acceptance from software developer's community is mainly based on its platform independence execution environment. In this paper, we analyze the degree of dependence between the Java Virtual Machine (JVM) and the underlying platform. We have observed that the Sun JVM (Java 2 SDK 1.2.2-006) API is independent from programmer's point of view, but offers different behaviour depending on the target HPI (H ...

**Keywords:** JVM, Java threads, concurrency, kernel threads, multithreaded, scheduling, user threads

**8 Automatic translation of Fortran to JVM bytecode**

Keith Seymour, Jack Dongarra

June 2001 **Proceedings of the 2001 joint ACM-ISCOPE conference on Java Grande**Full text available:  [pdf\(555.04 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper reports on the design of a FORTRAN-to-Java translator whose target language is the instruction set of the Java Virtual Machine. The goal of the translator is to generate Java implementations of legacy FORTRAN numerical codes in a consistent and reliable fashion. The benefits of directly generating bytecode are twofold. First, it provides a much more straightforward and efficient mechanism for translating FORTRAN GOTO statements. Second, it provides a framework for pursuing various ...

**9 Multilanguage programming on the JVM: the Ada 95 benefits**

Franco Gasperoni, Gary Dismukes

December 2000 **ACM SIGAda Ada Letters**, Volume XX Issue 4Full text available:  [pdf\(1.48 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

The latest trend in our industry, "pervasive computing", predicts the proliferation of numerous, often invisible, computing devices embedded in consumer appliances connected to the ubiquitous Internet. Secure, reliable applications combined with simplicity of use will make or break a company's reputation in this market. The Java "write once, run anywhere" paradigm, introduced by Sun in the mid-90s, is embodied in a widely available computing platform targeting pervasive devices. Although the Java ...

**10 Formalizing the safety of Java, the Java virtual machine, and Java card**

Pieter H. Hartel, Luc Moreau

December 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 4Full text available:  [pdf\(442.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We review the existing literature on Java safety, emphasizing formal approaches, and the impact of Java safety on small footprint devices such as smartcards. The conclusion is that although a lot of good work has been done, a more concerted effort is needed to build a coherent set of machine-readable formal models of the whole of Java and its implementation. This is a formidable task but we believe it is essential to build trust in Java safety, and thence to achieve ITSEC level 6 or Common Crite ...

**Keywords:** Common criteria, programming**11 A formal specification of Java class loading**

Zhenyu Qian, Allen Goldberg, Alessandro Coglio

October 2000 **ACM SIGPLAN Notices , Proceedings of the 15th ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications**, Volume 35 Issue 10Full text available:  [pdf\(241.45 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The Java Virtual Machine (JVM) has a novel and powerful mechanism to support lazy, dynamic class loading according to user-definable policies. Class loading directly impacts type safety, on which the security of Java applications is based. Conceptual bugs in the loading mechanism were found in earlier versions of the JVM that lead to type violations. A deeper understanding of the class loading mechanism, through such means as formal analysis, will improve our confidence that no additional bugs a ...

**12** ULT: a Java threads model for platform independent execution ☐

Ruben Pinilla, Marisa Gil

October 2003 **ACM SIGOPS Operating Systems Review**, Volume 37 Issue 4Full text available:  [pdf\(3.39 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Java is known to be a valuable technology for building platform independent applications, based on an independent execution environment provided by a virtual machine (JVM, Java Virtual Machine) and an API formed by a set of classes. The Java platform was conceived as a solution for application transportation between heterogeneous platforms without the need of adapting and recompiling the source code. Some previous analyses of Sun JVM implementation (Java 2 SDK 1.2.2-006) establish that the HPI ( ...

**Keywords:** HPI, JVM, Java threads, ULT, concurrency, kernel threads, multithreaded, scheduling, user threads

**13** Persistent execution state of a Java virtual machine ☐

Takashi Suezawa

June 2000 **Proceedings of the ACM 2000 conference on Java Grande**Full text available:  [pdf\(709.96 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** JVM, Java, checkpointing, execution state, persistence, recovery

**14** Providing soft real-time QoS guarantees for Java threads ☐

James C. Pang, Gholamali C. Shoja, Eric G. Manning

June 2001 **Proceedings of the 2001 joint ACM-ISCOPE conference on Java Grande**Full text available:  [pdf\(853.96 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The Java platform has many characteristics that make it very desirable for integrated continuous media processing. Unfortunately, it lacks the necessary CPU resource management facility to support quality of service guarantees for soft real-time multimedia tasks. In this paper, we present our new Java Virtual Machine, Q-JVM, which brings CPU resource management to the Java platform. Q-JVM is based on Sun's JVM version 1.1.5. It implements an enhanced version of the MTR-LS algorithm in its thr ...

**15** Techniques for obtaining high performance in Java programs ☐

Iffat H. Kazi, Howard H. Chen, Berdenia Stanley, David J. Lilja

September 2000 **ACM Computing Surveys (CSUR)**, Volume 32 Issue 3Full text available:  [pdf\(816.13 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


This survey describes research directions in techniques to improve the performance of programs written in the Java programming language. The standard technique for Java execution is interpretation, which provides for extensive portability of programs. A Java interpreter dynamically executes Java bytecodes, which comprise the instruction set of the Java Virtual Machine (JVM). Execution time performance of Java programs can be improved through compilation, possibly at the expense of portability ...

**Keywords:** Java, Java virtual machine, bytecode-to-source translators, direct compilers, dynamic compilation, interpreters, just-in-time compilers

**16** Multitasking without compromise: a virtual machine evolution ☐

Grzegorz Czajkowski, Laurent Daynés

October 2001 **ACM SIGPLAN Notices , Proceedings of the 16th ACM SIGPLAN conference on Object oriented programming, systems, languages, and applications**, Volume 36 Issue 11

Full text available:  [pdf\(220.97 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The multitasking virtual machine (called from now on simply MVM) is a modification of the Java virtual machine. It enables safe, secure, and scalable multitasking. Safety is achieved by strict isolation of application from one another. Resource control augment security by preventing some denial-of-service attacks. Improved scalability results from an aggressive application of the main design principle of MVM: share as much of the runtime as possible among applications and replicate everything el ...

**Keywords:** Java virtual machine, application isolation, native code execution, resource control

### 17 Targeting GNAT to the Java virtual machine

Cyrille Comar, Gary Dismukes, Franco Gasperoni

November 1997 **Proceedings of the conference on TRI-Ada '97**

Full text available:  [pdf\(1.72 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 18 Java bytecode as a typed term calculus

Tomoyuki Higuchi, Atsushi Ohori

October 2002 **Proceedings of the 4th ACM SIGPLAN international conference on Principles and practice of declarative programming**

Full text available:  [pdf\(214.36 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We propose a type system for the Java bytecode language, prove the type soundness, and develop a type inference algorithm. In contrast to the existing proposals, our type system yields a typed term calculus similar to type systems of lambda calculi. This enables us to transfer existing techniques and results of type theory to a JVM-style bytecode language. We show that ML-style let polymorphism and recursive types can be used to type JVM subroutines, and that there is an ML-style type inference ...

**Keywords:** Java bytecode, bytecode verifier, type inference, type system

### 19 Implementing jalapeño in Java

Bowen Alpern, C. R. Attanasio, Anthony Cocchi, Derek Lieber, Stephen Smith, Ton Ngo, John J. Barton, Susan Flynn Hummel, Janice C. Sheperd, Mark Mergen

October 1999 **ACM SIGPLAN Notices , Proceedings of the 14th ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications**, Volume 34 Issue 10

Full text available:  [pdf\(1.57 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Jalapeño is a virtual machine for Java™ servers written in Java. A running Java program involves four layers of functionality: the user code, the virtual-machine, the operating system, and the hardware. By drawing the Java / non-Java boundary below the virtual machine rather than above it, Jalapeño reduces the boundary-crossing overhead and opens up more opportunities for optimization. To get Jalapeño started, a boot image of a ...

20 A compositional account of the Java virtual machine

Phillip M. Yelland

January 1999 **Proceedings of the 26th ACM SIGPLAN-SIGACT symposium on Principles of programming languages**

Full text available:  [pdf\(1.40 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** Haskell, Java bytecode, Java virtual machine, verification

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javax.media.jai.operator

**Class NullDescriptor**[java.lang.Object](#)

```

|
+-- javax.media.jai.OperationDescriptorImpl
    |
    +-- javax.media.jai.operator.NullDescriptor

```

**All Implemented Interfaces:**[OperationDescriptor](#), [RegistryElementDescriptor](#), [Serializable](#)public class **NullDescriptor**extends [OperationDescriptorImpl](#)An [OperationDescriptor](#) describing the "Null" operation.

The "Null" operation performs no processing. It merely propagates its first source along the operation chain unmodified. There may be an arbitrary number of sources but only the first one is passed along so it must have the appropriate class type for the operation mode.

This operation may be useful as a placeholder in operation chains and in creating nodes to which [PropertyGenerators](#) may be attached. This would enable non-image data nodes to be present in chains without requiring that specific [OperationDescriptors](#) be implemented for these operations. The [PropertyGenerators](#) required would in this case be added locally to the nodes using the [addPropertyGenerator\(\)](#) method of the node.

## Resource List

Name	Value
GlobalName	Null
LocalName	Null
Vendor	com.sun.media.jai
Description	An operation which does no processing.
DocURL	<a href="http://java.sun.com/products/java-media/jai/forDevelopers/jai-apidocs/javax/media/jai/operator/NullDescriptor.html">http://java.sun.com/products/java-media/jai/forDevelopers/jai-apidocs/javax/media/jai/operator/NullDescriptor.html</a>
Version	1.0

No parameters are needed for this operation.

**Since:**



JAI 1.1

See Also:

[OperationDescriptor](#), [Serialized Form](#)**Fields inherited from class [javax.media.jai.OperationDescriptorImpl](#)**[resources](#), [sourceNames](#), [supportedModes](#)**Fields inherited from interface [javax.media.jai.OperationDescriptor](#)**[NO\\_PARAMETER\\_DEFAULT](#)**Constructor Summary**[NullDescriptor](#)()

Constructor.

**Method Summary**

static <a href="#">RenderedOp</a>	<a href="#">create</a> ( <a href="#">RenderedImage</a> source0, <a href="#">RenderingHints</a> hints) An operation which does no processing.
static <a href="#">RenderableOp</a>	<a href="#">createRenderable</a> ( <a href="#">RenderableImage</a> source0, <a href="#">RenderingHints</a> hints) An operation which does no processing.
<a href="#">Object</a>	<a href="#">getInvalidRegion</a> ( <a href="#">String</a> modeName, <a href="#">ParameterBlock</a> oldParamBlock, <a href="#">RenderingHints</a> oldHints, <a href="#">ParameterBlock</a> newParamBlock, <a href="#">RenderingHints</a> newHints, <a href="#">OperationNode</a> node) Calculates the region over which two distinct renderings of the "Null" operation may be expected to differ.
protected boolean	<a href="#">validateSources</a> ( <a href="#">String</a> modeName, <a href="#">ParameterBlock</a> args, <a href="#">StringBuffer</a> msg) Returns true if there is at least one source and the first source is a <a href="#">RenderedImage</a> or <a href="#">RenderableImage</a> .

**Methods inherited from class [javax.media.jai.OperationDescriptorImpl](#)**

[arePropertiesSupported](#), [getDefaultSourceClass](#), [getDestClass](#), [getDestClass](#), [getName](#), [getNumParameters](#), [getNumSources](#), [getParamClasses](#), [getParamDefaults](#), [getParamDefaultValue](#), [getParameterListDescriptor](#), [getParamMaxValue](#), [getParamMinValue](#), [getParamNames](#), [getPropertyGenerators](#), [getPropertyGenerators](#), [getRenderableDestClass](#), [getRenderableSourceClasses](#), [getResourceBundle](#), [getResources](#), [getSourceClasses](#), [getSourceClasses](#), [getSourceNames](#), [getSupportedModes](#), [isImmediate](#), [isModeSupported](#), [isRenderableSupported](#), [isRenderedSupported](#), [makeDefaultSourceClassList](#), [validateArguments](#), [validateArguments](#), [validateParameters](#), [validateParameters](#), [validateRenderableArguments](#), [validateRenderableSources](#), [validateSources](#)

**Methods inherited from class [java.lang.Object](#)**

[clone](#), [equals](#), [finalize](#), [getClass](#), [hashCode](#), [notify](#), [notifyAll](#), [toString](#), [wait](#), [wait](#), [wait](#)

## Constructor Detail

### NullDescriptor

```
public NullDescriptor()
```

Constructor.

## Method Detail

### validateSources

```
protected boolean validateSources(String modeName,  
                                  ParameterBlock args,  
                                  StringBuffer msg)
```

Returns true if there is at least one source and the first source is a `RenderedImage` or `RenderableImage`.

#### Overrides:

validateSources in class OperationDescriptorImpl

#### Throws:

IllegalArgumentException - if args is null.

IllegalArgumentException - if msg is null and the validation fails.

### getInvalidRegion

```
public Object getInvalidRegion(String modeName,  
                                ParameterBlock oldParamBlock,  
                                RenderingHints oldHints,  
                                ParameterBlock newParamBlock,  
                                RenderingHints newHints,  
                                OperationNode node)
```

Calculates the region over which two distinct renderings of the "Null" operation may be expected to differ.

The operation returns an empty `Shape` if the first source in each of the two `ParameterBlocks` are equal according to the `equals()` method of the old source or null for all other cases.

#### Overrides:

getInvalidRegion in class OperationDescriptorImpl

#### Parameters:

modeName - The name of the mode.

oldParamBlock - The previous sources and parameters.

oldHints - The previous hints.

newParamBlock - The current sources and parameters.

`newHints` - The current hints.

`node` - The affected node in the processing chain (ignored).

**Returns:**

The region over which the data of two renderings of this operation may be expected to be invalid null if there is no common region of validity. A non-null empty region indicates that the operation would produce identical data over the bounds of the old rendering although perhaps not over the area occupied by the *tiles* of the old rendering.

**Throws:**

[IllegalArgumentException](#) - if `modeName` is null or if either `oldParamBlock` or `newParamBlock` is null.

[IllegalArgumentException](#) - if `oldParamBlock` or `newParamBlock` does not contain at least one source.

## create

```
public static RenderedOp create(RenderedImage source0,
                                   RenderingHints hints)
```

An operation which does no processing.

Creates a `ParameterBlockJAI` from all supplied arguments except hints and invokes [JAI.create\(String, ParameterBlock, RenderingHints\)](#).

**Parameters:**

`source0` - `RenderedImage` source 0.

`hints` - The `RenderingHints` to use. May be null.

**Returns:**

The `RenderedOp` destination.

**Throws:**

[IllegalArgumentException](#) - if `source0` is null.

**See Also:**

[JAI](#), [ParameterBlockJAI](#), [RenderedOp](#)

## createRenderable

```
public static RenderableOp createRenderable(RenderableImage source0,
                                                RenderingHints hints)
```

An operation which does no processing.

Creates a `ParameterBlockJAI` from all supplied arguments except hints and invokes [JAI.createRenderable\(String, ParameterBlock, RenderingHints\)](#).

**Parameters:**

`source0` - `RenderableImage` source 0.

`hints` - The `RenderingHints` to use. May be null.

**Returns:**

The `RenderableOp` destination.

**Throws:**

`IllegalArgumentException` - if `source0` is null.

**See Also:**

`JAI`, `ParameterBlockJAI`, `RenderableOp`

---

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protected boolean	<u><a href="#">validateRenderableSources</a></u> ( <u><a href="#">ParameterBlock</a></u> args, <u><a href="#">StringBuffer</a></u> msg) <b>Deprecated. as of JAI 1.1 in favor of <a href="#">validateSources</a>("renderable", ...)</b>
protected boolean	<u><a href="#">validateSources</a></u> ( <u><a href="#">ParameterBlock</a></u> args, <u><a href="#">StringBuffer</a></u> msg) <b>Deprecated. as of JAI 1.1 in favor of <a href="#">validateSources</a>("rendered", ...)</b>
protected boolean	<u><a href="#">validateSources</a></u> ( <u><a href="#">String</a></u> modeName, <u><a href="#">ParameterBlock</a></u> args, <u><a href="#">StringBuffer</a></u> msg) Returns true if this operation supports the specified mode, and is capable of handling the given input source(s) for the specified mode.

### Methods inherited from class java.lang.Object

[clone](#), [equals](#), [finalize](#), [getClass](#), [hashCode](#), [notify](#), [notifyAll](#), [toString](#), [wait](#), [wait](#), [wait](#)

## Field Detail

### resources

protected final [String](#)[][] **resources**

The resource tags and their corresponding data, stored as an two-dimensional String array.

**Since:**

JAI 1.1

### supportedModes

protected final [String](#)[] **supportedModes**

An array of operation modes supported by this operator. Must be a non-empty subset of "rendered", "renderable", "collection" and "renderableCollection" or other image operator modes to be defined late

**Since:**

JAI 1.1

### sourceNames

protected final [String](#)[] **sourceNames**

An array of Strings that are the names of the sources of this operation. The names must be listed in th order corresponding to the source Classes.

**Since:**

JAI 1.1